



Fall 2007

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Intel Celebrates
30 Years
in Embedded

With a range of leading-edge processors, flash memory, standards-based building blocks, tools and technologies, Intel is committed to embedded developers, delivering reliable solutions that help you meet stringent platform requirements and competitive development schedules.

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Embedded Intel® Architecture Platforms

Intel enables long-life product availability and protects system investment for embedded customers by providing extended lifecycle support. This linecard features Intel's newest platforms. For a complete overview of embedded Intel® architecture building blocks and platforms, please visit intel.com/design/intarch.

	Features	Low Power			Low Power Value	Scalable	
		Intel® Core™ 2 Duo Processor T7500*/L7500*; Intel® GME965 Express Chipset; Intel® ICH8-M/ICH8-EM	Intel® Core™ 2 Duo Processor T7400*/L7400/U7500*; Intel® 945GME Express Chipset; Intel® ICH7-M/ICH7-M GHM	Intel® Core™ Duo Processor T2500*/L2400*; Intel® 945GME Express Chipset; Intel® ICH7-M/ICH7-M GHM	Intel® Celeron® M Processor 440*/423*/530*; Intel® 945GME Express Chipset; Intel® ICH7-M/ICH7-M GHM	Intel® Core™ 2 Duo Processor E6400*; E4300*, Intel® Pentium® Dual-Core 2160*, Intel® Celeron® D 352*/440*; Intel® Q965 Express Chipset; Intel® ICH8/ICH8-DO	Intel® Pentium® 4 Processor/Intel® Celeron® D Processor; Intel® 945G MCH, Intel® ICH7/ICH7R
CPU Features	Process	65nm	65nm	65nm	65nm	65nm	65nm-651,352 90nm-551,531,341
	Multi-Core	Dual-Core	Dual-Core	Dual-Core	Single-Core	DC-E6400, E4300, 2160 SC-352,440	Single-Core
	Dual Processor	No	No	No	No	No	No
	Performance Frequency [FSB]	2.20GHz [800MHz]	2.16GHz [667MHz]	2.0GHz [667MHz]	1.73GHz/1.86GHz [533MHz]	E4300-1.80GHz [800MHz] 2160-1.80GHz [800MHz] 352-3.2GHz [533MHz] 440-2.00GHz [800MHz]	651-3.4GHz [800MHz] 551-3.4GHz [800MHz] 531-3.0GHz [800MHz] 352-3.2GHz [533MHz] 341-2.93GHz [533MHz]
	LV Frequency [FSB]	1.60GHz [800MHz]	1.5GHz [667MHz]	1.66GHz [667MHz]			
	ULV Frequency [FSB]		1.06GHz [533MHz]		1.06GHz [533MHz]		
	SV TDP	35W	34W	31W	31W (530) 27W (440)	65W	651-65W 551/531-84W 352-86W 341-84W
	LV TDP	17W	17W	15W			
	ULV TDP		10W		5.5W (423)		
	Intel® 64 Architecture [†]	Yes	Yes	No	Yes (530)	Yes	Yes
	L2 Cache	4MB	4MB	2MB	1MB	E4300-2MB 2160-1MB	651-2MB 551/531-1MB 352-512KB 341-256KB
	VID	0.75V-1.3V	0.75V-1.3V	0.7625V-1.3V	0.95V-1.30V (530) 1.0V-1.3V (440)	0.85V-1.5V (2160)	1.2V-1.3375V 1.25V-1.325V
	LV VID	0.75V-1.2V	0.75V-1.1V	0.7625V-1.2125V			
	ULV VID		0.75V-0.975V		0.8V-1.1V (423)		
	Tj max @TDP	100°C	100°C	100°C	100°C	Tc = 61.4°C2	Tc = 69.2°C Tc = 69.2°C
	Package(s)	478 uFC-PGA; 479 uFC-BGA (LV is BGA only)	478 uFC-PGA; 479 uFC-BGA (LV and ULV is BGA only)	478 uFC-PGA; 479 uFC-BGA (LV is BGA only)	478 uFC-PGA; 479 uFC-BGA (ULV is BGA only)	LGA 775	LGA 775
	Enhanced Intel SpeedStep®	Yes	Yes	Yes	No	Yes	Yes
	FSB Parity	No	No	No	No	No	No
MCH Features	TDP	13.5W	5.8W-7.0W	5.8W-7.0W	5.8W-7.0W	28W	22.2W
	DDR2	533MHz/667MHz	400MHz/533MHz/ 667MHz	400MHz/533MHz/ 667MHz	400MHz/533MHz	533MHz/667MHz/ 800MHz	533MHz/667MHz
	Max Memory Size	4GB	4GB	4GB	4GB	8GB	4GB
	ECC Memory	No	No	No	No	No	No
	Integrated Graphics	Yes	Yes	Yes	Yes	Yes	Yes
	Graphic Output Type	VGA, LVDS, SDVO	VGA, SDVO, LVDS	VGA, SDVO, LVDS	VGA, SDVO, LVDS	SDVO, VGA	SDVO, VGA
	Dual Independent Display Support	Yes	Yes	Yes	Yes	Yes	Yes
	PCI Express*	(1) x 16 Graphics or 1 General I/O	(1) x 16 Graphics or 1 General I/O	(1) x 16 Graphics or 1 General I/O	(1) x 16 Graphics or 1 General I/O	(1) x 16 Graphics or 1 General I/O	(1) x 16 Graphics or 1 General I/O
ICH Features	Interconnect	DMI	DMI	DMI	DMI	DMI	DMI
	TDP (Max)	2.4W	1.7W	1.7W	1.7W	3.7W	3.3W
	AC' 97	No	Yes	Yes	Yes	No	Yes
	Intel® HD Audio	Yes	Yes	Yes	Yes	Yes	Yes
	ATA/100	1 channel	1 channel	1 channel	1 channel	No	2 channels
	SATA	SATA (3 Ports)	SATA (2 Ports)	SATA (2 Ports)	SATA (2 Ports)	ICH8DO (6 Ports) ICH8 (4 Ports)	SATA (4 Ports)
	RAID	Yes-ICH8-EM No-ICH8-M	Yes (0,1) on ICH7-M GHM only	Yes (0,1) on ICH7-M GHM only	Yes (0,1) on ICH7-M GHM only	(0, 1, 5, 10) on ICH8 DO only	Yes (0, 1, 5, 10) on ICH7R only
	USB 2.0	10 Ports	8 Ports	8 Ports	8 Ports	10 Ports	8 Ports
	PCI	4 (32/33)	6 (32/33)	6 (32/33)	6 (32/33)	4 (32/33)	6 (32/33)
	PCI-X	No	No	No	No	No	No
	PCI Express	(6) x 1 Ports Configurable Rev. 2.0	(4) x 1 Ports/(6) x 1 Ports Configurable	(4) x 1 Ports/(6) x 1 Ports Configurable	(4) x 1 Ports/(6) x 1 Ports Configurable	(4) x 1 Ports/(6) x 1 Ports/(2) x 1 Ports	(4) x 1/(6) x 1 Ports Configurable

[†] 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Performance will vary depending on your hardware and software configurations. Consult with your system vendor for more information.

Scalable	Performance					
Intel® Core™ 2 Duo Processors E6400*/E4300*; Intel® Celeron® Processor 440*; Intel® 3010 Express Chipset; ICH7/ICH7-R	Quad-Core Intel® Xeon® Processor E5335*; Intel® 5000P MCH, Intel® 6321ESB ICH	Dual-Core Intel® Xeon® Processor LV 5148*/5138*/5128*; Intel® 5000P MCH, Intel® 6321ESB ICH	Dual-Core Intel® Xeon® Processor 5140*/5130*; Intel® 5000P Memory Controller Hub, Intel® 6321ESB ICH	Dual-Core Intel® Xeon® Processors LV and ULV; Intel® 3100 Chipset ¹	Intel® Core™ Duo Processor U2500*/Intel® Celeron® M Processor 423*; Intel® 3100 Chipset ¹	Intel® Pentium® M Processor 745*/Intel® Pentium® M Processor 738*; Intel® 3100 Chipset ¹
65nm	65nm	65nm	65nm	65nm	65nm	90nm
DC-E6400, E4300 SC-440	Quad-Core	Dual-Core	Dual-Core	Dual-Core	Dual-Core/Single-Core	Single-Core
No	Yes	Yes	Yes	No	No	No
E6400-2.13GHz [1066MHz] E4300-1.80GHz [800MHz] 440-2.00GHz	2.6GHz [1333MHz]	No	2.33GHz 2.0GHz [1333MHz]	2.0GHz [667MHz]	1.2GHz [533MHz] (U2500)	1.8GHz [400MHz]
	No	2.33GHz [1333MHz] 2.13GHz [1066MHz] 1.86GHz [1066MHz]	No	1.66GHz [667MHz] [533MHz] ²	1.06GHz	1.4GHz [400MHz]
E6400/E4300-65W 440-35W	80W		65W	31W		21W
		40W/35W/35W		15W		10W
Yes	Yes	Yes	Yes	Yes	9W/5.5W No	No
E6400/E4300-2MB 440-512KB	8MB	4MB	4MB	2MB	2MB/1MB	2MB
0.8500V-1.3625V	1V-1.5V		1V-1.5V			1.276V-1.340V
		1V-1.5V		0.825V-1.275V	0.8V-1.1V (2500) 0.825V-1.2125V (ULV)	1.116V 0.75V-1.1V ²
61.4°C	Tc = 66°C	Tc = 71°C nominal, 86°C short term (5138 only)/ Tc = 58°C (5148/5128)	Tc = 65°C	100°C	100°C	100°C
LGA 775	LGA 771	LGA 771	LGA 771	478 uFC-PGA	479 uFC-BGA	478 uFC-PGA, 479 uFC-BGA (LV is BGA only)
Yes	Yes	Yes	Yes	Yes	Yes (U2500)	Yes
No	Yes	Yes	Yes	Yes	No	No
13.6W	24.7W-30W	24.7W-30W	24.7W-30W	10.4W-12.4W	10.4W-12.4W	10.4W-12.4W
533MHz/667MHz/ 800MHz	Fully Buffered DIMMs 533MHz/667MHz	Fully Buffered DIMMs 533MHz/667MHz	Fully Buffered DIMMs 533MHz/667MHz	400MHz	400MHz	400MHz
8GB	64GB	64GB	64GB	16GB	4GB	4GB
Yes	Yes	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	No	No
None	No	No	No	No	No	No
No	No	No	No	No	No	No
2 x 8 General I/O 1 x 16 General I/O	(3) x 8 Ports (1 x 8 connects to ESB2)	(3) x 8 Ports (1 x 8 connects to ESB2)	(3) x 8 Ports (1 x 8 connects to ESB2)	(1) x 8 Port	(1) x 8 Port	(1) x 8 Port
DMI	ESI	ESI	ESI	No	No	No
3.3W		12.4W	12.4W	12.4W	No	No
Yes	Yes	Yes	Yes	No	No	No
Yes	Yes	Yes	Yes	No	No	No
1 channel	2 channels	2 channels	2 channels	No	No	No
SATA (4 Ports)	SATA (6 Ports)	SATA (6 Ports)	SATA (6 Ports)	SATA 1.0a (4 Ports) SATA AHCI (6 Ports)	SATA 1.0a (4 Ports) SATA AHCI (6 Ports)	SATA 1.0a (6 Ports) SATA AHCI (6 Ports)
Yes	Yes (0, 1, 5, 10)	Yes (0, 1, 5, 10)	Yes (0, 1, 5, 10)	No	No	No
8 Ports	8 Ports	8 Ports	8 Ports	4 Ports	4 Ports	4 Ports
6 (32/33)	7 (32/33)	7 (32/33)	7 (32/33)	2 (32/33)	2 (32/33)	2 (32/33)
No	4 (64/66)	4 (64/66)	4 (64/66)	No	No	No
(4) x 1/(6) x 1 Ports Configurable	(4) x 1 Ports or (1) x 4 Port/ (2) x 4 Ports or (1) x 8 Port	(4) x 1 Ports or (1) x 4 Port/ (2) x 4 Ports or (1) x 8 Port	(4) x 1 Ports or (1) x 4 Port/ (2) x 4 Ports or (1) x 8 Port	(4) x 1 Ports	(4) x 1 Ports Configurable	(4) x 1 Ports Configurable

¹ Intel® 3100 Chipset is an integrated MCH+ICH on one chip. ² Single core. Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See intel.com/products/processor_number for details. **Note:** 65nm: Intel Pentium 4 processor 651 with HT Technology; 90nm: Intel Pentium 4 processor 531 and 551 with HT Technology and Intel Celeron D processors 335 and 341; 0.13µ: Intel Pentium and Intel Celeron processors. Intel Pentium 4 processor 551 and 551 with HT Technology or Intel Celeron D processors 341 only.

Intel® NAND Flash Memory

Intel NAND Flash Memory				
Density	Product	Package	Connector	Vcc
4GB	SSDUSMS0004G1	USB SSD Module	2x5 Standard Profile	5V
4GB	SSDUSMS0004GL	USB SSD Module	2x5 Low Profile	5V
2GB	SSDUSMS0002G1	USB SSD Module	2x5 Standard Profile	5V
2GB	SSDUSMS0002GL	USB SSD Module	2x5 Low Profile	5V
1GB	SSDUSMS0001G1	USB SSD Module	2x5 Standard Profile	5V
1GB	SSDUSMS0001GL	USB SSD Module	2x5 Low Profile	5V

Intel® NOR Flash Memory

Intel StrataFlash® Embedded Memory (P33) ¹								
Density	Product	Organization	Access Time (ns)	Package	Pin/Ball Count	Vcc	Vpp	I/O
512 Mb	48F4400POT	32M x 16	85[25]*[17] ^b	RD/PF/RC/PC/TE/JS	88/64/56	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V
256 Mb	28F256P33	16M x 16	85[25]*[17] ^b	TE/JS/RC/PC	56/64	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V
	48F4000POX	16M x 16	85[25]*[17] ^b	RD/PF	88	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V
128 Mb	28F128P33	8M x 16	85[25]*[17] ^b	TE/JS/RC/PC	56/64	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V
	48F3000POX	8M x 16	85[25]*[17] ^b	RD/PF	88	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V
64 Mb	28F640P33	4M x 16	85[25]*[17] ^b	TE/JS/RC/PC	56/64	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V
	48F2000POX	4M x 16	85[25]*[17] ^b	RD/PF	88	2.3-3.6V	1.5-3.6V or 9V	2.3-3.6V

Intel StrataFlash® Embedded Memory (P30) ¹								
Density	Product	Organization	Access Time (ns)	Package	Pin/Ball Count	Vcc	Vpp	I/O
512 Mb	48F4400POV	32M x 16	85[25]*[17] ^b	RD/PF/RC/PC/TE/JS	88/64/56	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V
256 Mb	28F256P30	16M X 16	85[25]*[17] ^b	TE/JS/RC/PC	56/64	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V
	48F4000POZ	16M X 16	85[25]*[17] ^b	RD/PF	88	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V
128 Mb	28F128P30	8M X 16	85[25]*[17] ^b	TE/JS/RC/PC	56/64	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V
	48F3000POZ	8M X 16	85[25]*[17] ^b	RD/PF	88	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V
64 Mb	28F640P30	4M X 16	85[25]*[17] ^b	TE/JS/RC/PC	56/64	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V
	48F2000POZ	4M X 16	85[25]*[17] ^b	RD/PF	88	1.7-2.0V	0.9-3.6V or 9V	1.7-3.6V

Intel® Serial Flash Memory (S33) ¹								
Density	Product	Organization	Access Time (ns)	Package	Pin/Ball Count	Vcc	Vpp	I/O
64 Mb	25F640S33	8 Kb x 8, 64 Kb x 127	8	SOIC-16	16	2.7-3.6V	N/A	N/A
32 Mb	25F320S33	8 Kb x 8, 64 Kb x 63	8	SOIC-16	16	2.7-3.6V	N/A	N/A
16 Mb	25F016S33	8 Kb x 8, 64 Kb x 31	8	SOIC-8	8	2.7-3.6V	N/A	N/A
	25F160S33	8 Kb x 8, 64 Kb x 31	8	SOIC-16	16	2.7-3.6V	N/A	N/A

Intel® Embedded Flash Memory (J3 v. D) ¹								
Density	Product	Organization	Access Time (ns)	Package	Pin/Ball Count	Vcc	Vpp/Vpen	I/O
256Mb	28F256J3D	128Kb/64Kw x 256	95[25]	TE/JS/RC/PC	56/64	2.7-3.6V	3V	2.7-3.6V
256Mb	48F3300J0Z	128Kb/64Kw x 256	75[25]	RC/PC	64 x 2	2.7-3.6V	3V	2.7-3.6V
128 Mb	28F128J3D	128 Kb/64Kw x 128	75[25] ^a	TE/JS/RC/PC	56/64	2.7-3.6V	3V	2.7-3.6V
64 Mb	28F640J3D	128 Kb/64Kw x 64	75[25] ^a	TE/JS/RC/PC	56/64	2.7-3.6V	3V	2.7-3.6V
32 Mb	28F320J3D	128 Kb/64Kw x 32	75[25] ^a	TE/JS/RC/PC	56/64	2.7-3.6V	3V	2.7-3.6V

Intel® Wireless Flash Memory (W18/W30) ¹								
Density	Product	Organization	Access Time (ns)	Package	Pin/Ball Count	Vcc	Vpp/Vpen	I/O
128 Mb	28F128W18	8M x 16	60[20]*[11] ^b 80[25]*[14] ^b	GE, PH	56	1.70-1.95V	0.9-1.95V or 12V	1.35-2.24V
	28F128W30	8M x 16	70[25]*[20] ^b	GE, PH	56	1.70-1.90V	0.9-1.95V or 12V	2.2-3.3V
64 Mb	28F640W18	4M x 16	60[20]*[11] ^b 80[25]*[14] ^b	GE, PH	56	1.70-1.95V	0.9-1.95V or 12V	1.35-2.24V
	28F640W30	4M x 16	70[25]*[20] ^b 85[25]*[22] ^b	GE, PH	56	1.70-1.90V	0.9-1.95V or 12V	2.2-3.3V
32 Mb	28F320W18	2M x 16	60[20]*[11] ^b 80[25]*[14] ^b	GE, PH	56	1.70-1.95V	0.9-1.95V or 12V	1.35-2.24V
	28F320W30	2M x 16	70[25]*[20] ^b 85[25]*[22] ^b	GE, PH	56	1.70-1.90V	0.9-1.95V or 12V	2.2-3.3V

Intel® Advanced+ Boot Block (C3) Flash Memory ¹									
Density	Product	Organization	Access Time (ns)	Temp Range	Package	Pin Count	V _{CC}	V _{PP} /V _{PEN}	I/O
32 Mb	28F320C3	2M x 16	70, 90	E	TE/JS/GE/PH/RC/PC	48/64	2.7–3.6V	1.65–3.6V or 12V	1.65–2.5V or 2.7–3.6V
16 Mb	28F160C3	1M x 16	70, 90	E	TE/JS/GE/PH/RC/PC	48/64	2.7–3.6V	1.65–3.6V or 12V	1.65–2.5V or 2.7–3.6V
8 Mb	28F800C3	512K x 16	70	E	TE/JS/RC/PC	48/64	2.7–3.6V	1.65–3.6V or 12V	1.65–2.5V or 2.7–3.6V

¹ Extended Temperature Range: -40°C to +85°C

Access Time Footnotes: a = Page Mode Access b = Synchronous Burst Mode

Intel® PCI Bridges

Primary and Secondary PCI Interface Features						
Transparent	Model Number	PCI Bus	Write Buffer	Read Buffer	Delayed Transaction Queue	CLK, REQ #, GNT # Pins
Yes	21152	32-bit	88 Bytes	72 Bytes	3 entries	4 sets
Yes	21154	64-bit	88 Bytes/152 Bytes	152 Bytes	3 entries	9 sets @ 33 MHz, 4 sets @ 66 MHz
No	21555	64-bit	256 Bytes	256 Bytes	4 entries	9 sets @ 33 MHz, 4 sets @ 66 MHz
Yes	31154	64-bit	8 KBytes	8 KBytes	9 - 24	9 sets PCI-X*
Yes	41110	64-bit	1 KByte	1 KByte	4 entries	6 sets PCI-X
Yes	41210	64-bit	1 KByte	1 KByte	4 entries	6 sets per PCI-X bus

Other Product Features						
Transparent	Model Number	JTAG	GPIO	Package	PCI Revision	Max. Clock
Yes	21152	No	No	160 PQFP	2.3	33 MHz
Yes	21154	Yes	Yes	304 PBGA	2.3	33 MHz/66 MHz
No	21555	Yes	No	304 PBGA	2.3	33 MHz/66 MHz
Yes	31154	Yes	Yes	421 PBGA	PCI-X* v1.0b	133 MHz
Yes	41110	Yes	No	567 FC3BGA	PCI Express* 1.0a, PCI-X v1.0b	2.5 GHz/133 MHz
Yes	41210	Yes	No	567 FC3BGA	PCI Express 1.0a, PCI-X v1.0b	2.5 GHz/133 MHz

Intel® Ethernet Controllers

Intel® Fast Ethernet Controllers						Intel® 10 GbE Controllers
Product Name	Intel® 82559 Intel® 82559ER	Intel® 82551QM Intel® 82551ER Intel® 82551IT	Intel® 82562ET Intel® 82562EM Intel® 82562GT	Intel® 82562GZ	Intel® 82562V	Intel® 82598EB
Device	Single-Port MAC/PHY	Single-port MAC/PHY	Single-port PHY	Single-port PHY	Single-port PHY	Dual-port MAC
Package Size	15x15mm	15x15mm	15.85x7.5mm	15x15mm	10x10mm	31x31mm
Physical Package	196-pin BGA	196-pin BGA	48-pin SSOP	196-pin BGA	81-pin FCMMAP BGA	883-pin FCBGA
Bus Type	PCI	PCI	LCI	LCI	LCI	PCI Express*
Bus Speed	33 MHz	33 MHz	—	—	—	x/2/4/8
Power (Typical)	0.675W	0.61W	0.3W	0.3W	0.3W	-4.8W (Dual-port) -3.5W (Single-port)
Power (Standby)	0.05W @ 3.3V	0.05W @ 3.3V	0.05W @ 3.3V	0.05W @ 3.3V	0.05W @ 3.3V	21 mA @ 3.3V, 51 mA @ 1.8V 486 mA @ 1.2V
Operating Temperature	0 - 85°C	0 - 85°C -40 - 85°C (IT)	0 - 85°C	0 - 85°C	0 - 70°C	0-55°C
Power Supply	3.3V	3.3V	3.3V	3.3V	3.3V	1.0, 1.8, 3.3V
Order Code	GD82559, GD82559ER	GD82551QM, GD82551ER GD82551IT	DA82562ET, DA82562EM	GD82562GZ	PC82562V	JL82598EB
Lead-Free SKU	—	LU82551QM, LU82551ER LU82551IT	EP82562ET, EP82562GT	LU82562GZ	PC82562V	JL82598EB
Footprint Compatible	—	Intel® 82540EM/EP, 82541PI/ER	—	Intel® 82540EM/EP, 82541PI/ER, 82573E/L	Intel® 82566DM	—

Intel® Gigabit Ethernet Controllers							
Product Name	Intel® 82572EI Intel® 82571EB	Intel® 82575EB	Intel® 82564EB Intel® 82563EB	Intel® 82545GM Intel® 82546GB	Intel® 82541PI Intel® 82541ER	Intel® 82573E/V Intel® 82573L	Intel® 82566DM
Device	Single-port, dual-port MAC/PHY/SerDes	Dual-port MAC/PHY/SerDes/SGCMII	Single-port, dual-port PHY	Single-port, dual-port MAC/PHY/SerDes	Single-port MAC/PHY	Single-port MAC/PHY	Single-port PHY
Package Size	17x17 mm	25x25 mm	14x14 mm	21x21 mm	15x15 mm	15x15 mm	10x10 mm
Physical Package	256-pin FCBGA	576-pin FCBGA	100-pin TQFP	364-pin TFBGA 364-pin PBGA	196-pin PBGA	196-pin TFBGA	81-pin FCMMAP BGA
Bus Type	PCI Express*	PCI Express*	GLCI	PCI/PCI-X*	PCI	PCI Express*	GLCI/LCI
Bus Speed	x1/x2/x4	x1/x2/x4	—	33/66/133 MHz	33/66 MHz	x1	—
Power (Typical)	~1.5 W, ~0.7 W (SerDes) ~2.8 W, ~1.8 W (SerDes)	~2.4 W, ~0.7 W (SerDes)	~1.3 W ~2.6 W	~1.5 W ~2.6 W, ~1.5 W (SerDes)	~1.0 W —	~1.3 W ~1.2 W	~1.2 W —
Power (Standby)	220 mA @ 3.3V 226 mA @ 3.3V	171 mA @ 3.3V	360 mA @ 3.3V	125 mA @ 3.3V 220 mA @ 3.3V	45 mA @ 3.3V	11 mA @ 3.3V 14 mA @ 3.3V	29 mA @ 3.3V
Operating Temp	0 - 70° C 0 - 70° C¹	0 - 70° C	0 - 60° C	0 - 70° C 0 - 55° C	0 - 70° C	0 - 70° C	0 - 70° C
Power Supply	1.1, 1.8, 3.3V	1.0, 1.8, 3.3V	1.2, 1.9, 3.3V	1.5, 2.5, 3.3V	1.2, 1.8, 3.3V	1.2, 2.5, 3.3V	1.0, 1.8, 3.3V
Order Code	HL82572EI HL82571EB	HL82575EB	HL82564EB HL82563EB	RC82545GM FW82546GB	GD82541PI GD82541ER	RC82573E RC82573V RC82573L	RU82566DM
Lead-Free SKU	JL82572EI JL82571EB	JL82575EB	HY82564EB HY82563EB	PC82545GM NHB2546GB	LU82541PI LU82541ER	PC82573E PC82573V PC82573L	RU82566DM

¹ 0-70° C with thermal management

Intel XScale® Technology-Based Processors

	Intel® IXP420 and Intel® IXP425 Network Processors	Intel® IXP421 and Intel® IXP422 Network Processors	Intel® IXP423 Network Processor	Intel® IXP430 and Intel® IXP435 Network Processors	Intel® IXP431 and Intel® IXP432 Network Processors	Intel® IXP433 Network Processor
Core Speed (MHz)	266/400/533	266	266/533	400/533/667	400	400/533
Processor Cores						
WAN/Voice NPE (Utopia 2 and HSSO, 1)		•	•	no yes	yes no	HSS only
PCMCIA	PCI bridge needed	PCI bridge needed	PCI bridge needed	PCI bridge needed	PCI bridge needed	PCI bridge needed
CompactFlash*	expansion bus	expansion bus	expansion bus	expansion bus	expansion bus	expansion bus
ECC						
Dynamic Memory	16/32-bit wide	16/32-bit wide	16/32-bit wide	16/32-bit wide	16/32-bit wide	16/32-bit wide
SDRAM	133 MHz	133 MHz	133 MHz			
DDR				266 MHz	266 MHz	266 MHz
DDR2				400MHz	400MHz	400MHz
Static Memory	16-bit wide	16-bit wide	16-bit wide	16-bit wide	16-bit wide	16-bit wide
ROM	•	•	•	•	•	•
SRAM	•	•	•	•	•	•
FLASH	•	•	•	•	•	•
UART	2	2	2	1	1	1
I ² C	via GPIO	via GPIO	via GPIO	via GPIO	via GPIO	via GPIO
SPI	via GPIO	via GPIO	via GPIO	via SSP	via SSP	via SSP
SSP				•	•	•
HSS-Voice		•	•	no yes	yes no	•
HSS-WAN		•	•	no yes	yes no	•
UTOPIA 2		•	•	no yes	yes no	•
Ethernet MII/SMII	2 MII	1 MII 2MII	2MII	2MII	1 MII 2MII	2MII
GPIO Number	16	16	16	16	16	16
DMA Controller						
SAS/SATA						
USB Client	•	•	•			
USB Host/OTG				2 hosts	2 hosts	2 hosts
PCI 2.2 Host I/F	32-bit, 33/66 MHz	32-bit, 33/66 MHz	32-bit, 33/66 MHz	32-bit, 33MHz	32-bit, 33MHz	32-bit, 33MHz
PCI-X*						
PCI-Express*						
AES/DES/DES3				no yes	no yes	
SHA-1/MD-5				no yes	no yes	
SHA-256/-384/-512/EAU				no yes	no yes	
HW RNG						
HDL Channels		•	•	no yes	yes no	•
Expansion Bus	16-bit, 66 MHz	16-bit, 66 MHz	16-bit, 66 MHz	16bit 80Mhz	16bit 80Mhz	16bit 80Mhz
At MHz, Power Dissipation (typical for PXA; all others MAX)	at 266 MHz, 2.2W; at 400 MHz, 2.33W; at 533 MHz, 2.47W	at 266 MHz, 1.9W	at 266 MHz, 1.9W	at 400Mhz, 3.03W at 533Mhz, 3.08W at 667Mhz, 3.12W	at 400Mhz, 3.03W at 533Mhz, 3.08W at 667Mhz, 3.12W	at 400Mhz, 3.03W at 533Mhz, 3.08W at 667Mhz, 3.12W
Windows CE .NET*	•	•	•			
VxWorks*	•	•	•			
Linux*	•	•	•	•	•	•
Other OS						
SDK Available						
Development Platform	•	•	•	•	•	•
Extended Temperature	-40°C to 85°C			-40°C to 85°C		
Package Type	492-pin 35x35x1.27 PBGA	492-pin 35x35x1.27 PBGA	492-pin 35x35x1.27 PBGA	460-pin, 31mm x 31mm BGA	460-pin, 31mm x 31mm BGA	460-pin, 31mm x 31mm BGA
Lead-Free SKU	•	•	•	•	•	•



Intel® IXP455 Network Processor	Intel® IXP460 and Intel® IXP465 Network Processors	Intel® 80219 General Purpose PCI Processor	Intel® IOP331 I/O Processor	Intel® IOP341 and IOP342 I/O Intel® Processors	Intel® IOP348 I/O Processor	
266/400/533	266/400/533/667	400/600	500/667/800	800/1200	677/800/1200	Core Speed (MHz)
•		1	1	1 2	1	Processor Cores
PCI bridge needed	PCI bridge needed					WAN/Voice NPE (Utopia 2 and HSS0, 1)
expansion bus	expansion bus	expansion bus	expansion bus	expansion bus	expansion bus	PCMCIA
	•	•	•	•	•	CompactFlash*
32-bit wide	32-bit wide	32/64-bit wide	32/64-bit wide	32/64-bit wide	32/64-bit wide	ECC
						Dynamic Memory
266 MHz	266 MHz	200 MHz	333 MHz			SDRAM
			400 MHz	533 MHz	533 MHz	DDR
16/32-bit-wide	16/32-bit wide	16/32-bit wide	16-bit wide	16-bit wide	16-bit wide	DDR2
•	•	•	•	•	•	Static Memory
•	•	•	•	1MB		ROM
•	•	•	•	•	•	SRAM
2	2	0	2	2	2	FLASH
•	•	•	•	•	•	UART
•	•					I²C
•	•					SPI
•	•					SSP
•						HSS-Voice
•						HSS-WAN
•						UTOPIA 2
3 MII or 3 SMII	2 MII or 2 SMII 3 MII or 3 SMII					Ethernet MII/SMII
16	16	8	8	8	8	GPIO Number
		•	•	3	3	DMA Controller
•	•				8 ports	SAS/SATA
• (no OTG)	• (no OTG)					USB Client
32-bit, 33/66 MHz	32-bit, 33/66 MHz	64-bit, 66 MHz/133 MHz	64-bit, 66 MHz/133 MHz	64-bit, 66 MHz/133 MHz	64-bit, 66 MHz/133 MHz	USB Host/OTG
		•	•	•	•	PCI 2.2 Host I/F
•				x8	x8	PCI-X*
•						PCI-Express*
•						AES/DES/DES3
•	EAU					SHA-1/MD-5
•						SHA-256/-384/-512/EAU
•						HW RNG
16/32-bit, 80 MHz (w/ external mastering)	16/32-bit, 80 MHz (w/ external mastering)	32-bit, 33/66/100/133 MHz	8/16-bit, 33/66/100/133 MHz	8/16-bit, 33/66/100/133 MHz	8/16-bit, 33/66/100/133 MHz	HDLC Channels
at 266 MHz, 2.8W; at 400 MHz, 3.0W; at 533 MHz, 3.2W	at 266 MHz, 2.8W; at 400 MHz, 3.0W; at 533 MHz, 3.2W; at 667 MHz, 4.0W	at 400 MHz, 2.9W at 600 MHz, 3.5W	at 500 MHz, 7.9W; at 667 MHz, 8.1W; at 800 MHz, 8.2W	at 800 MHz, 8.2W; at 1200 MHz, 10.0W	at 800 MHz, 8.2W; at 1200 MHz, 10.0W	Expansion Bus
•	•	•	•	•	•	At MHz, Power Dissipation (typical for PXA; all others MAX)
•	•	•	•	•	•	Windows CE .NET*
		Wasabi, ECOS, Express Logic, Timesys	Timesys	Timesys	Timesys	VxWorks*
						Linux*
						Other OS
•	•	•	•	•	•	SDK Available
-40°C to 85°C	-40°C to 85°C	0°C to 85°C				Development Platform
544-pin 35x35x1.27 PBGA	544-pin 35x35x1.27 PBGA	544-pin 35x35x1.27 LPBGA	829-ball 37.5x27.5 FCBGA	1357-ball 37.5x37.5 FCBGA	1357-ball 37.5x37.5 FCBGA	Extended Temperature
•	•	•	•	•	•	Package Type
						Lead-Free SKU



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